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## **METHOD FOR EXTRACTING INFORMATION ASSOCIATED WITH A SEARCH TERM**

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### **FIELD OF THE INVENTION**

20 The present invention relates to extracting information from an electronic document associated with a search term and more specifically with a method that identifies and displays tagged information contained in an electronic document where the tagged information is located in proximity to an occurrence of a search term.

### **BACKGROUND OF THE INVENTION**

25 Electronic document editors are widely used in homes and businesses today. Familiar examples of these editors include word processing applications that operate on personal computers (PCs) and note-taking applications that operate on personal data assistants (PDAs). These applications strive to replace paper as the simplest means to record and communicate information. The utility of these applications increase when  
30 they can be tied to other software applications, such as drawing applications, spreadsheet applications, web browser applications, and contact management applications. Similarly, the utility of an electronic document editor is increased when the editor can manage certain pieces of information contained in an electronic document that are likely to be of special significance to a user, such as names and addresses.

35 When an individual takes notes, such as in a business meeting or a classroom, contact information within those notes may be of special significance to a note-taker. For example, an individual taking notes in a meeting may record a person's name and, near

5 the recorded name, put that person's telephone number. This situation is the same whether the note-taker is using a paper and pencil or a free-form electronic document editor. However, in a free-form electronic document editor, or other electronic document editor, certain types of information can be identified by the electronic document editor and tagged.

10 One example of information tagging is the use of "SMART TAGS" in business productivity computer software applications by Microsoft Corporation of Redmond, Washington. One such application is "MICROSOFT WORD." The software application can recognize certain strings of text characters as representing one of a number of categories of data. These categories may include names, physical addresses, e-mail  
15 addresses, universal resource locators (URLs), dates, and telephone numbers. When the software application recognizes a string of characters as possibly falling into a specific category of information, the application tags that string. In other words, the application identifies that string within an electronic document as having the characteristics of the data category. The application may provide a visual or other indication to a user through  
20 a graphical user interface (GUI) that the data string has been tagged. The application also may provide the capability for a user to act on the data string as a special data type, for example, by allowing a user to add the information to an address book of a contact management software application.

One advantage of taking notes using a free-form document editor as compared to  
25 paper and pencil is the capability of searching the notes with a search routine. In other words, a search function of the electronic document editor allows the user to locate a specific word or phrase by designating the word or phrase as a search term. The search routine can look through a large number of pages of notes in a very short time. In contrast, a person searching through paper notes may exhaust a large amount of time  
30 while having to review every line of many pages of notes to locate the word or phrase of interest.

Although a search routine in an electronic document editor has advantages over visually, or otherwise manually, scanning pieces of paper, searches through electronic

5 documents have a weakness. A user must know the word or phrase as it appears in the  
electronic document to locate that word or phrase. This weakness is ameliorated by the  
capability of a user to insert a search term that the user suspects is located near a word or  
phrase that the user is actually looking for but that the user does not know its exact  
content, such as a telephone number. The user can then go to the locations within an  
10 electronic document identified by the search routine as containing the search term and  
visually or otherwise search for the desired information. For example, if a user needs to  
know an individual's telephone number and the user suspects that the telephone number  
is recorded in an electronic document near the individual's name, the user can use the  
individual's name as a search term and browse through an electronic document at each  
15 identified location of that individual's name and look for a telephone number. This  
ameliorating process still requires a user to move to locations within an electronic  
document identified by a search routine as containing the search term and browse the  
electronic document manually to find the desired information.

What is needed is a method that combines the technology of information tags with  
20 the technology of a search routine. The desired electronic document editor can return, as  
a result of conducting a search on a search term, tagged information that is located near  
the search term in an electronic document, such that the user will not have to browse the  
electronic document to find the information.

## 25 SUMMARY OF THE INVENTION

The present invention provides a computer-implemented method for extracting  
tagged data items that may be associated with results of a search in an electronic  
document and presenting the tagged data items through a graphical user interface (GUI).  
The GUI can include a window for displaying the search results and a separate window  
30 for displaying the tagged data items. In the alternative, the GUI can present the tagged  
data items adjacent to individual search results or at the top of a window displaying  
search results. The displayed tagged items may be presented as hyperlinks that enable a

5 user to move to a section of an electronic document containing that tagged data item. The tagged data items, which typically include names, physical addresses, e-mail addresses, universal resource locators (URLs), dates, and telephone numbers, may represent a subset of the tagged data item categories contained in the electronic document. A user may want to extract the tagged data items and have them displayed  
10 with search results since these tagged data items may represent facts about a search term that may be of interest to a user. Similarly, a user may have searched on a specific search term for the express reason of calling up data items located near the search term in a document, such as searching on a person's name to extract that person's telephone number.

15 In one aspect of the present invention, a computer-implemented method for displaying one or more tagged data items near a result of a search of an electronic document is provided. This method comprises the steps of (1) locating one of more results of the implemented search within the electronic document; (2) identifying one or more tagged data items present in the electronic document within a distance from each  
20 search result; and (3) displaying on a user interface a list of the one or more tagged items identified as within the distance from each search result.

In another aspect, a computer-implemented method for identifying one or more tagged data items near a result of a search of an electronic document is provided. This method comprises the steps of (1) implementing the search of the electronic document;  
25 (2) locating one of more results of the implemented search within the electronic document; and (3) determining if one or more tagged data items are present in the electronic document within a distance from each search result.

The aspects of the present invention may be more clearly understood and appreciated from a review of the following detailed description of the disclosed  
30 embodiments and by reference to the drawings and claims.

## 5 BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a block diagram illustrating a representative operating environment for an exemplary embodiment of the present invention.

Figure 2 is a block diagram depicting functional components of an exemplary electronic document editor and related input devices.

10 Figure 3 is a flow diagram presenting a process for extracting specially-marked data items located near a result of a search of an electronic document in accordance with an exemplary embodiment of the present invention.

15 Figure 4a is a flow diagram presenting a process for identifying specially-marked data items located near a result of a search of an electronic document in accordance with an exemplary embodiment of the present invention.

Figure 4b is a flow diagram presenting a process for determining if specially-marked data items are located near a result of a search of an electronic document in accordance with an exemplary embodiment of the present invention.

20 Figure 5a is a flow diagram presenting a process for presenting specially-marked data items located near a result of a search of an electronic document in accordance with an exemplary embodiment of the present invention.

Figure 5b is a flow diagram presenting a process for integrating specially-marked data items with the search results of a search of an electronic document in accordance with an exemplary embodiment of the present invention.

25 Figure 6 is a display image showing a user interface having a window presenting search results and associated facts from a search of an electronic document in accordance with an exemplary embodiment of the present invention.

30 Figure 7 is a display image showing a portion of a window presenting search results from a search of an electronic document in accordance with an exemplary embodiment of the present invention.

5           Figure 8 is a display image showing a portion of a window presenting search results from a search of an electronic document in accordance with an alternative exemplary embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

10           Exemplary embodiments of the present invention support a method for extracting tagged data items that may be associated with results of a search in an electronic document and presenting the tagged data items through a graphical user interface (GUI). The GUI can include a window for displaying the search results and a separate window for displaying the tagged data items. In the alternative, the GUI can present the tagged  
15   data items adjacent to individual search results or at the top of a window displaying search results. The displayed tagged items may be presented as hyperlinks that enable a user to move to a section of an electronic document containing that tagged data item. The tagged data items, which typically include names, physical addresses, e-mail addresses, universal resource locators (URLs), dates, and telephone numbers, may  
20   represent a subset of the tagged data item categories contained in the electronic document. A user may want to extract the tagged data items and have them displayed with search results since these tagged data items may represent facts about a search term that may be of interest to a user. Similarly, a user may have searched on a specific search term for the express reason of calling up data items located near the search term in a  
25   document, such as searching on a person's name to extract that person's telephone number.

          Figure 1 illustrates a representative operating environment 100 for an exemplary embodiment of the present invention. This representative operating environment includes a general-purpose computing device in the form of a conventional personal  
30   computer 101. Generally, the personal computer 101 includes a processing unit 120, a system memory 104, and a system bus 102 that couples system components including the system memory 104 to the processing unit 120. The system bus 102 may be any of

5 several types of bus structures including a memory bus or memory controller, a peripheral bus, and a local bus using any bus architecture. The system memory includes a read-only memory (ROM) 106 and a random access memory (RAM) 110. A basic input/output system (BIOS) 108, containing the basic routines that help to transfer information between elements within personal computer 101, such as during start-up, is  
10 stored in ROM 106.

Personal computer 101 further includes a hard disk drive 128, a floppy disk drive 132 for reading from or writing to a removable magnetic disk 134, and an optical disk drive 138 for reading from or writing to a removable optical disk 140 such as a CD-ROM or other optical media. Hard disk drive 128, magnetic disk drive 132, and optical disk  
15 drive 138 are connected to system bus 102 by a hard disk drive interface 120, a floppy disk drive interface 130, and a CD-ROM disk drive interface 136, respectively. Although the exemplary environment described herein employs hard disk 128, removable magnetic disk 134, and removable optical disk 140, it should be appreciated by those skilled in the art that other types of computer readable media that can store data that is accessible by a  
20 computer, such as magnetic cassettes, flash memory cards, digital video disks, Bernoulli cartridges, RAMs, ROMs, and the like, may also be used in the exemplary operating environment. The drives and their associated computer-readable media provide nonvolatile storage of computer-executable instructions, data structures, program modules, and other data for personal computer 101.

25 A number of program modules may be stored on hard disk 128, magnetic disk 134, optical disk 140, ROM 106, or RAM 110, including an operating system 112, an electronic document editor 114, and multiple application programs 116-118. A representative embodiment of a document editor is disclosed in more detail below in connection with Figure 2. Program modules typically include routines, sub-routines, programs, objects, components, data structures, etc., that perform particular tasks or  
30 implement particular abstract data types.

A user may enter commands and information into personal computer 101 through input devices, such as a keyboard 146 and a pointing device, such as mouse 144.

5 Pointing devices may also include a trackball (not shown) and an electronic pen or stylus (not shown) that can be used in conjunction with an electronic tablet or a typical display screen. Other input devices (all not shown) may include a microphone, joystick, game pad, satellite dish, scanner, or the like. These and other input devices are often connected to processing unit 120 through a serial port interface 142 that is coupled to the system bus  
10 102, but may be connected by other interfaces, such as a parallel port, game port, a universal serial bus (USB), or the like. A display device, such as monitor 124, may also be connected to system bus 102 via an interface, such as a video adapter 122. In addition to the monitor, personal computers typically include other peripheral output devices (not shown), such as speakers and printers.

15 The personal computer 101 may operate in a networked environment using logical connections to one or more remote computers 154. Remote computer 154 may be another personal computer, a server, a client, a router, a network PC, a peer device, or other common network node. While a remote computer 154 typically includes many or all of the elements described above relative to the personal computer 101, only a memory  
20 storage device 156 has been illustrated in Figure 1. The memory storage device 156 may include application program 158 and application program 160. The logical connections depicted in Figure 1 include a local area network (LAN) 152 and a wide area network (WAN) 162. Such networking environments are commonplace in offices, enterprise-wide computer networks, intranets, and the Internet.

25 When used in a LAN networking environment, the personal computer 101 is often connected to the local area network 152 through a network interface or adapter 150. When used in a WAN networking environment, the personal computer 101 typically includes a modem 148 or other means for establishing communications over WAN 162, such as the Internet. Modem 148, which may be internal or external, is connected to  
30 system bus 102 via serial port interface 142. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computers may be used.



5           Moreover, those skilled in the art will appreciate that the present invention may be implemented in other computer system configurations, including PDAs, electronic writing tablets, multiprocessor systems, microprocessor based or programmable consumer electronics, network person computers, minicomputers, mainframe computers, and the like. The invention may also be practiced in distributed computing environments,  
10       where tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

          Figure 2 is a block diagram depicting the primary functional components of an exemplary electronic document editor and related input devices for the representative  
15       operating environment of an electronic writing tablet, otherwise described as an electronic tablet. Specifically, Figure 2 depicts an architecture 200 for an electronic writing tablet in the context of an electronic document editor constructed in accordance with an exemplary embodiment of the present invention. Conventional input devices are represented by the keyboard 260 and the pointing device 265 (*e.g.*, mouse, trackball).  
20       Other output devices (not shown) can include a printer or speaker. Other hardware components shown in Figure 2 include an electronic tablet 250 and an accompanying stylus 255. The tablet 250 and stylus 255 are used to input handwriting strokes that can be converted to data, referred to as electronic ink. The electronic ink may be incorporated into an electronic document 220 and may be displayed on either the  
25       electronic tablet 250, the monitor 270, or both. Although the electronic tablet 250 and the monitor 270 are illustrated as being distinct, in an exemplary embodiment of the present invention, they can be integrated into a single component. The joint tablet/monitor component has the ability to display information and receive input from the stylus 255.

          In the representative architecture 200, an ink-processing module 225 is operable  
30       to receive data from the electronic tablet 250 and to render that data as electronic ink. In one embodiment of the present invention, the ink-processing module 225 can be a collection of software modules that perform different tasks for rendering handwriting strokes as electronic ink. For example, the stylus and ink module 228 can receive data

5 describing the positions and angles of the stylus for a series of handwriting strokes. The stylus and ink module **228** can interpret the data for rendering electronic ink. Other software modules, such as a gesture recognizer **230** and word recognizer **235** can be designed to identify certain handwriting strokes and assign them a particular significance. For example, certain gestures such as a cross-out may be recognized and associated with  
10 other editing processes. The ink-processing module **225** can also include an erasing functions module **240** for removing electronic ink that has been previously rendered.

Although ink processing modules are known in the art and necessary for an electronic tablet to function, a novel document editing module has been developed by Microsoft Corporation of Redmond, Washington that capitalizes on the benefits of  
15 handwriting processing technology. The module (i.e., document editor) is a free-form document editor that leverages the functionality of electronic handwriting technology to enable more effective and efficient note taking. Specifically, document editing module **205** facilitates manipulating electronic ink so that a user can create and modify an electronic document **220** with greater ease and sophistication. The document editing  
20 module **205** typically comprises a collection of software modules for controlling and manipulating electronic ink rendered on the monitor **270** and for presenting search results for a search of an electronic document.

For example, the exemplary document editing module **205** includes a search module **210**, a UI Module **215**, and an information tag module **217**. A user may want to  
25 locate a word or phrase within an electronic document **220**. The word or phrase, also referred to herein as a search term, can be inputted to the document editing module **205** by a user, through the keyboard **260**, the stylus **255**, or other input device. The exemplary search module **210** locates occurrences of the search term, also referred to herein as hits, in response to a user initiating a search, if the electronic document contains  
30 items that match the search term. The search module **210** typically causes the UI to distinctly display the hits to a user, such as by highlighting the hits in an electronic document **220** in a way that contrasts with the normal display of the electronic document's **220** content.

5           The exemplary UI module **215** controls the images displayed on the tablet **250** or the monitor **270**. The UI module may accept input data from a user to the document editing module **205**, such as when a user actuates a control displayed by the UI module **215** with a pointing device **265** or stylus **255**. The UI module **215** displays a variety of images that can be used to input information to the document editing module **205**, such as  
10 buttons, menus, drop-down boxes, and boxes that accept text characters.

          The exemplary information tag module **217** identifies certain words or phrases in an electronic document **220** as belonging to one or more specific categories of data. For example, when a phrase such as “123 Main St.” is input into an electronic document **220**, the information tag module **217** identifies this phrase as a physical address. Similarly,  
15 when a phrase such as “404-555-9876” is input into an electronic document **220**, the information tag module **217** identifies this phrase as a telephone number. The information tag module **217** causes the UI module **215** to provide a visual indication to a user that the word or phrase falls within a designated category of information. The category designations may be made by the document editing module **205** or a user, such  
20 as by selecting options in a menu.

          The UI module **215** may also provide an on-object-user interface (OOUI) for the data item. This OOUI allows a user to use a pointing device **265** or stylus **255** and point at the word or phrase as it is being displayed on a monitor **270** or tablet **250**. This pointing action causes a menu to appear that allows the user to perform additional actions  
25 on the word or phrase, such as adding the information to an address book or removing the tag. In other words, the OOUI can be used to specify that a word or phrase should not be categorized as indicated by the information tag module **217**.

          Exemplary embodiments of the present invention relate most directly to extracting tagged or specially-marked data items associated with a search term in an electronic  
30 document **220** and presenting the data items via a user interface. Figures 1 and 2 provide a general overview of the environments in which the inventors contemplate exemplary embodiments of the present invention will be used.

5           Figure 3 is a flow diagram presenting a process 300 for extracting specially-  
marked data items located near a result of a search of an electronic document in  
accordance with an exemplary embodiment of the present invention. Referring to  
Figures 2 and 3, at step 310, a UI module 215 receives a search term. This step may be  
accomplished by a user entering the search term into a location of a GUI designed to  
10   accept the search term, such as a box for entering text characters. At step 320, a search  
module 210 receives the search term from the UI module 215 and executes the search of  
the electronic document to locate all search terms present in the document. This  
execution may be triggered by a user actuating a search initiation control presented on a  
GUI.

15           At step 330, the search module 210 identifies tagged data located near a search  
term within an electronic document 220. The identified tagged data items are associated  
with the search terms for the search of the electronic document. This step is discussed in  
greater detail below, in conjunction with Figure 4. At step 340, the UI module 215  
presents search results received from the search module 210 to the user. The search  
20   results with include the tagged data items if the search module 210 identifies tagged data  
in step 330. This presentation may be in a separate search results window, as shown in  
Figure 7. Step 340 is discussed in greater detail below, in conjunction with Figure 5. At  
step 350, a user may navigate among the search results, if desired.

For some exemplary embodiments, the search results are presented in a window  
25   separate from a window containing the electronic document 220. The UI module 215  
may link individual search results and tagged data items presented in the search results  
window to the location of the result or data item in the electronic document 220. As  
such, a user may be able to cause a portion of content within the electronic document 220  
containing the result of the search or tagged data items to be displayed by actuating a  
30   hyperlink associated with the result or tagged data item. In other words, search results  
and tagged data items, as displayed in the search results window, may be formatted as  
hyperlink text and the user may be able to use a pointing device 265, such as a mouse or  
trackball, or a stylus 255 to actuate the hyperlink and cause a portion of the electronic

5 document 220 containing that result or data item to be displayed on a monitor 270 or tablet 250 in a window containing the electronic document 220.

At step 360, the process 300 determines if a new search is to be performed. This determination may be based on the UI module 215 receiving a new search term. If so, the process 300 returns to step 310. If not, the process 300 ends at step 370.

10 Figure 4a is a flow diagram presenting a process 330 for identifying specially-marked data items located near a result of a search of an electronic document 220 in accordance with an exemplary embodiment of the present invention. Referring to Figures 2, 3, and 4a, at step 410, the search module 210 locates occurrences of the search term received at step 310 within a designated range. This range may be designated by a user and may include a single electronic document 220 or one or more portions of a single electronic document 220 or multiple documents. Alternatively, the document editing module 205 may specify the search range. This range may be a default range and the default range may be specified by a user, such as by selecting an option in a menu.

20 At step 420, the search module 210 identifies tagged information, also referred to herein as tagged data items, located near each occurrence of a search result. For an exemplary embodiment, the term “near” or “proximate” means between the same paragraph marks as the search term. Alternatively, the search module 210 may establish a different rule for what constitutes “near” or “proximate.” This rule may be based on the number of lines or characters between the search result and the tagged information. For example, a rule may define “near” or “proximate” to mean within ten lines of text from the search term. Alternatively, a rule may define “near” or “proximate” based on linguistic or grammatical rules specific to the language of the text. One skilled in the art would appreciate that a large variety of rules could be established to determine if tagged information within an electronic document 220 is located “near” an occurrence of a search result. Step 420 is described in greater detail below, in conjunction with Figure 4b.

30 At step 430, the search module 210 determines if tagged information was located near one or more occurrences of a search term in the search range. If the result at step

5     **430** is “No,” the process **330** moves to step **440** and the process skips to step **540** (Figure 5a). This step is discussed in greater detail below, in conjunction with Figure 5a. If, at step **430**, the result is “Yes,” then the process **330** moves to step **340** of process **300**.

Figure 4b is a flow diagram presenting a process **420** for determining if specially-  
marked data items are located near a result of a search of an electronic document **220** in  
10     accordance with an exemplary embodiment of the present invention. Referring to  
Figures 2, 3, 4a, and 4b, at step **460**, the search module **210** determines the proximity rule  
for identifying tagged data items near search results. This rule may be established by the  
document editing module **205** or by a user, such as by a user selecting an option in a  
menu. One example of a proximity rule is that all tagged data items between the same  
15     paragraph marks as a search term result are proximate, or near, that search term.

At step **470**, the search module **210** determines a rule to identify applicable tagged  
data items. One rule may be to identify all tagged data items that satisfy the proximity  
rule of step **460**. Alternatively, the search module **210** may have some grammatical  
semantic intelligence to help it decide if a tagged data item makes sense to be associated  
20     with the search term. For example, the search module **210** may have a rule that says that  
telephone numbers can only be facts about query terms that are proper nouns. As such, if  
a tagged data item representing a telephone number satisfied the proximity rule to a  
search term “Mary,” it would be considered a fact about Mary, while if it was found near  
a fact term “cholesterol,” it would not be considered a fact about cholesterol.

25     At step **480**, the search module **210** determines, for each search result identified at  
step **410**, if any tagged data items are proximate, or near, the search result. In other  
words, the search module **210** determines if the proximity rule is satisfied for any tagged  
data items with respect to a specific search result.

At step **490**, the process **420** determines if additional search results exist, that is,  
30     whether there are additional search results that have yet to be evaluated at step **480**. If so,  
the process **420** returns to step **480**. As such, steps **480** and **490** form a loop that  
evaluates each occurrence of a search result identified at step **410**. If no additional search  
results exist, then the process **420** moves to step **430** in process **330**.

5           Figure 5a is a flow diagram presenting a process **340** for presenting specially-  
marked data located near a result of a search of an electronic document in accordance  
with an exemplary embodiment of the present invention. Referring to Figures 2, 3, 4, and  
5, at step **510**, an information tag module **217** selects which types of tagged information  
will be identified and presented with search results. The information tag module **217**  
10 may tag data items from a large variety of information categories. Only a subset of those  
categories may be used in associating search term results with tagged information. For  
example, categories such as names, physical addresses, e-mail addresses, URLs, dates,  
and telephone numbers may be associated with search term results. Other categories,  
including categories for special industries, such as legal case names or sports teams'  
15 names, may be excluded from the association with search results. The list of categories  
that may be associated with search results may be selected by the document editing  
module **205** or selected by a user, such as by choosing options from a menu. At step **510**,  
the information tag module **217** filters the results of step **420** such that tagged data items  
associated with selected information tag categories are returned with search results.

20           At step **520**, the information tag module **217** sorts tagged data items that passed  
through the filter of step **510**. This sorting step may include grouping categories together.  
This sorting step may also include prioritizing the data item categories. For example, all  
telephone numbers may be grouped together and presented as the first group of data items  
in the search result pane. Alternatively, the data items could be arranged as they are  
25 encountered in the search range, with the first encountered tagged data item, that is, the  
first data item encountered in the direction of the search, at the top of the list and so on.  
One skilled in the art would appreciate that the tagged data items could be arranged in a  
variety of ways.

30           At step **530**, the search module **210** receives the data items sorted at step **520** and  
integrates the data items with the search results, that is, with the individual occurrences of  
the search term. In this integration step, all of the tagged data items may be presented at  
the top of the search results pane. Alternatively, each tagged data item could be  
presented adjacent to the search result that is near that data item, in other words, the

5 search result that triggered including the tagged data item in the search results pane. Step 530 is described in greater detail below, in connection with Figure 5b.

At step 540, the UI module 215 presents the tagged data items, if any are found, in the newly-opened search results pane in the order determined at step 530, in other words, either at the top of the search results pane or adjacent to individual search results. 10 One skilled in the art would appreciate that these two alternative are not the only alternatives for presenting the results. For example, a combination of the two alternatives may be used, where some tagged data categories are presented at the top of a search results pane while other categories are presented adjacent to the individual search term results. In yet another alternative, all of the search results could be suppressed, such 15 that the display window shows tagged data items associated with the search only.

Figure 5b is a flow diagram presenting a process 530 for integrating specially-marked data items with the search results of a search of an electronic document 220 in accordance with an exemplary embodiment of the present invention. At step 560, search module 210 determines how tagged items are to be arranged in a search results window. 20 For example, the tagged data items may be arranged at the top of the window, with search results beneath them. Alternatively, a tagged data item could be presented adjacent to a search result that triggered including that data item in the list.

At step 570, the search module 210 arranges the tagged data items and search results according to the determination at step 560. At step 580, the search module 210 25 passes the arranged tagged data items and search results to the UI module 215. The process 530 then moves to step 540 in process 340.

Figure 6 is a display image 600 showing a window presenting search results and associated facts from a search of an electronic document in accordance with an exemplary embodiment of the present invention. Referring to Figures 2 and 6, search 30 results may be displayed by the UI module 215 in a separate window 610 from an electronic document 220. The exemplary window pane 610 includes search controls, such as a box 620 for receiving text characters that may define a search term, such as a search term "Mary." The window pane 610 also includes controls 630 that define how



5 the search results are displayed. The window pane 610 also includes a control 670 for a user to specify a range of a search. These specifications may be presented in a drop down menu.

The window pane 610 presents facts 640 associated with the search term "Mary." These facts 640 are presented beneath a heading 650, which reads "Facts about Mary."  
10 These facts 640 and heading 650 are presented on the top of a list that presents other search results 690.

The window pane 610 also presents search results 690 for review by a user in response to completion of a search of an electronic document 220. The results are presented under a search results heading 680, such as a heading 680 reading "Other  
15 Search Results." The results may also include a control 660 that enables a user to collapse a sublist of results. One skilled in the art would appreciate that search results and associated facts could be presented to a user in a variety of ways.

Figure 7 is a display image 700 showing a portion of a window presenting search results from a search of an electronic document 220 in accordance with an exemplary  
20 embodiment of the present invention. Referring to Figures 2 and 7, the UI module 215 presents search results with tagged data items 720 appearing at the top of the search results window pane 705. The search results window pane 705 may include a label 710 over the presented tagged data items 720, such as "Facts about Search Term" or other descriptive label. The exemplary search results window pane 705 typically includes a  
25 control 740 for collapsing a sublist of facts or search results 750. The list of search term results 750 may be headed by a label 730 indicating that the sublist comprises search results rather than facts associated with the search term. For an exemplary embodiment, the UI module 215 may present the listed tagged data items 720 and search results 750 as  
30 hyperlinks, which may enable a user to click on the terms in the search results window pane 705 with a pointing device 265 or stylus 255 and cause a portion of an electronic document 220 containing that search term result or tagged data item to be displayed in a window.

5           Figure 8 is a display image **800** showing a portion of a window presenting search results from a search of an electronic document **220** in accordance with an alternative exemplary embodiment of the present invention. Referring to Figures 2, 7, and 8, the UI module **215** presents search results **830, 850, 870, 880** with tagged data items **840, 860, 890** appearing adjacent to a search result **830, 850, 870, 880** in search results window  
10   pane **805**. The search results window pane **805** includes a label **810** over the results, such as “Search Term Results and Facts” or other descriptive label. The search results window pane **805** includes a control **820** for collapsing a sublist of facts or search results. The list of search term results **830, 850, 870, 880** are presented in the search results window pane **805** grouped with facts associated with each search result. For example, a  
15   search term of “Smith” may be used. The term “Smith” may be found in a electronic document section entitled “Kick-off meeting with Project Alpha team.” The search results window pane **805** may present that section title **830** as containing “Smith.” The title **830** may be presented with ellipses (. . .) to indicate that the title is longer than that title printed in the search results window pane **805** and may include a date associated  
20   with that section. A telephone number, “404-555-1234,” may have been identified near the occurrence of “Smith” in the electronic document section entitled “Kick-off meeting with Project Alpha team.” The UI module **215** presents the telephone number “404-555-1234,” **840** beneath the title “Kick-off meeting with . . .” **830** in the search results pane **805**. The telephone number **840** may be presented in a different font type or a different  
25   alignment in the search results window pane **805**. The UI module **215** presents the listed tagged data items **840, 860, 890** and search results **830, 850, 870, 880** as hyperlinks.

One skilled in the art would appreciate that the present invention supports a method for extracting tagged data items that may be associated with results of a search in an electronic document and presenting the tagged data items through a GUI. The tagged  
30   data may be presented in a separate window displaying search results. The tagged data items may be presented adjacent to individual search results or at the top of a window displaying search results or in another configuration. The displayed tagged items may be presented as hyperlinks that enable a user to move to a section of an electronic document

- 5 containing that tagged data item. The tagged data items, which may include names, physical addresses, e-mail addresses, URLs, dates, and telephone numbers, may represent a subset of the tagged data item categories contained in the electronic document.